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Application No. 10/765,426
Filed: January 27, 2004
TC Art Unit: 1725
Confirmation No.: 1527

REMARKS

Claims 1-3, 5, 6, 11-14, and 16-21 have been rejected under 35 U.S.C. § 103(a) over Schmidt et al. (US Pat. No. 6,182,442) in view of Vidal et al. (US Pat. No. 6,397,581). Reconsideration of this rejection is respectfully requested.

Amended independent claim 1 substantially incorporates the subject matter of dependent claim 16, now canceled. Claim 1 also clarifies that the porosity reduction step is carried out after at least one part has been formed from a thermostructural composite material obtained by densifying a porous fiber perform with a matrix and before a metal coating is formed on the inside face of the at least one part. (See the specification at page 2, lines 7-10 and 26-30, page 7, line 26, to page 8, line 8, and page 9, lines 22-24.) Claim 1 also recites that the porosity reduction treatment includes the introduction of a filling material within the surface pores. (See the specification at page 8, lines 12-14 and 21-23.) Thus, the surface porosity reduction step is distinguished from the densification of the fiber preform with a matrix and from the forming of a metal coating.

Also, the bonding by hot compression is carried out at a temperature lower than the melting temperature of the metal used for bonding. (See the specification at page 11, lines 30-36.) Thus, the hot compression bonding step in claim 1 distinguishes over soldering or brazing techniques that imply the melting of a metal used for bonding.

Schmidt discloses the forming of a Cr_2O_3 or Al_2O_3 layer on the inside face of one part and of a SiC layer on the inside face of the other part in order to produce a "ceramic soldering or welding

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TEL. (617) 542-2290
FAX. (617) 451-0313

joint interface layer" by pressing the parts together and firing (col. 6, lines 56-67).

Vidal discloses the forming of a metal layer on the inside faces of the parts to be assembled and the brazing of the parts together. As noted by the Examiner, Vidal mentions that the metal layer serves to leakproof the walls of the fluid circulation channels, since the thermostructural composite material presents residual porosity. While Vidal discloses a metal coating, Vidal does not, however, disclose an additional prior step of porosity reduction by introducing a filling material within the surface pores of the thermostructural composite material, as recited in claim 1.

The forming of a metal layer that closes the surface porosity is not of the same nature as the filling of the surface pores with a filling material. Such filling is also important so as to avoid the metal coating being damaged during the use of the cooling panel. Indeed, since the thermostructural composite material and the metal coating have different thermal elongation coefficients, the metal coating may be subjected to local stresses at the locations at which it covers edges of surface pores. The filling of the surface pores serves not only to improve leakproofing but also to reduce asperities at the inside face of a part on which a metal coating is formed. Thus, the recited surface porosity reduction step has a dual effect of sealing by reducing porosity and enhancing leakproofing by smoothing the surface of the inside face and thus avoiding possible damage of the metal coating. This additional step is not disclosed, taught, or suggested by Schmidt or Vidal.

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TEL. (617) 542-2290
FAX. (617) 451-0313

Also, by carrying out the bonding at a temperature lower than the melting point of the metal used for bonding, the claimed method avoids introducing any possible discontinuity of the bonding contrary to soldering or brazing (see specification, page 12, lines 9-12).

According, claim 1 and the claims dependent therefrom are believed to be patentable over Schmidt in view of Vidal.

Clams 7, 8, and 15 have been rejected under § 103(a) over Schmidt et al. in view of Vidal et al. and further in view of Walsh (EP 0306140). These claims are believed to be patentable for the reasons set forth above with respect to claim 1. Accordingly, no further discussion is believed necessary at this time.

Claims 9 and 10 have been rejected under § 103(a) over Schmidt et al. in view of Vidal et al. and further in view of Jahnke (US Pat. No. 4,611,752). These claims are believed to be patentable for the reasons set forth above with respect to claim 1. Accordingly, no further discussion is believed necessary at this time.

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
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In view of the above amendments and remarks, all claims are believed to be in condition for allowance, and reconsideration and indication thereof are respectfully requested. The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

JEAN-MICHEL LARRIEU ET AL.

By: Beverly E. Hjorth
Beverly E. Hjorth
Registration No. 32,033
Attorney for Applicants

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
Ten Post Office Square
Boston, MA 02109
Telephone: (617) 542-2290
Telecopier: (617) 451-0313

352192.1

WEINGARTEN, SCHURGIN,
GAGNEBIN & LEBOVICI LLP
TEL. (617) 542-2290
FAX. (617) 451-0313